Journal of the Royal Society of Arts

NO. 4967 FRIDAY, 23RD DECEMBER, 1955 VOL. CIV

FORTHCOMING MEETINGS

FRIDAY, 30TH DECEMBER, at 2.30 p.m. DR. MANN JUVENILE LECTURE. '*Clocks and Watches—How They Work*', by A. W. Marshall, of Smiths English Clocks, Ltd. (The lecture will be illustrated with a film, lantern slides and working models. *Admission by special ticket only, obtainable from the Secretary.*)

MONDAY, 2ND JANUARY, at 6.30 p.m. FILM EVENING. (See notice below.)

WEDNESDAY, 4TH JANUARY, at 2.30 p.m. DR. MANN JUVENILE LECTURE. '*The History of the Circus*', by Antony D. Hippisley Coxe. (The lecture will be illustrated with a film and a demonstration. *Admission by special ticket only, obtainable from the Secretary.*)

WEDNESDAY, 11TH JANUARY, at 2.30 p.m. '*A New Approach to Furniture Design*', being a symposium of three papers: (i) '*Research in the Furniture Industry*', by M. J. Merrick, B.Sc.(Eng.), G.I.Mech.E., Head of Research Department, Furniture Development Council. (ii) '*Its Application to Furniture Construction*', by T. Kotas, B.Sc.(Eng.), G.I.Mech.E. (iii) '*Its Effect on the Character of Furniture*', by Robin Day, A.R.C.A., F.S.I.A. Sir Herman Lebus, C.B.E., J.P., Chairman and Managing Director, Messrs. Harris Lebus, Ltd., will preside. The papers will be illustrated with lantern slides. (*Special tickets are required for this meeting.*)

WEDNESDAY, 18TH JANUARY, at 2.30 p.m. TRUEMAN WOOD LECTURE. '*Benjamin Franklin in London*', by Professor E. N. da C. Andrade, D.Sc., Ph.D., LL.D., F.R.S. R. W. Holland, O.B.E., M.A., M.Sc., LL.D., Chairman of the Council of the Society, will preside.

WEDNESDAY, 25TH JANUARY, at 2.30 p.m. FERNHURST LECTURE. '*Insect Physiology in Relation to Insecticides*', by V. B. Wigglesworth, C.B.E., M.D., F.R.S., Quick Professor of Biology, University of Cambridge. E. Holmes, M.Sc., Ph.D., Technical Director, Plant Protection, Ltd., will preside.

TUESDAY, 31ST JANUARY, at 5.15 p.m. COMMONWEALTH SECTION. '*Recent Developments in the Federation of Rhodesia and Nyasaland*', by Sir Gilbert Rennie, G.B.E., K.C.M.G., M.C., High Commissioner for the Federation of Rhodesia and Nyasaland. The Right Honble. Lord Reith, P.C., G.C.V.O., G.B.E., C.B., T.D., Chairman, Colonial Development Corporation, will preside. (Tea will be served from 4.30 p.m.)

Fellows are entitled to attend any of the above meetings without tickets (except where otherwise stated), and may also bring two guests. When they cannot accompany their guests, Fellows may give them special passes, books of which can be obtained on application to the Secretary.

FILM EVENING

As announced in the last issue of the *Journal* the second Film Evening of the Session will be held on Monday, 2nd January, at **6.30 p.m.**, and, as is customary, the programme has been selected for its interest not only to Fellows but also to their older children. The films to be screened are as follows:

Elizabethan Express
Magic Strings
The Story of My Life
Woodpeckers

Elizabethan Express (20 minutes), which was produced by British Transport Films, concerns, as its title implies, the 6½ hour non-stop journey of 'The Elizabethan' train from King's Cross to Edinburgh, giving a glimpse of the general planning which lies behind it and the organization necessary for the actual run, and including shots of the progress of the train along its course. The film will be introduced by its producer, Mr. Edgar Anstey.

Magic Strings (15 minutes) is in colour and shows from both behind and in front of the stage a performance given by Waldo and Muriel Lanchester with their puppets. It was produced by Stewart Films and will be introduced by its producer.

The Story of My Life (32 minutes) is a Danish film with English commentary which, by the clever filming of contemporary engravings and still photographs, dramatically tells the story, in autobiographic form, of the life of Hans Christian Andersen.

Woodpeckers (17 minutes) is an outstanding German nature film about the woodpecker which, by means of infra-red photography and very clever camera work, brings to the screen something of the instincts and habits of these birds, particularly in connection with nesting and the raising of their young. The film was produced by Heinz Sielmann of Munich, but it has been re-edited and dubbed with an English commentary by James Fisher.

Tickets of admission are not required and Fellows are entitled to introduce two guests. Light refreshments will be served in the Library **beforehand** from **5.45 p.m.**

MEETING OF COUNCIL

A meeting of Council was held on Monday, 12th December, 1955. Present: Dr. R. W. Holland (in the Chair); Mrs. Mary Adams; Sir Alfred Bossom; Sir Edward Crowe; Mr. Robin Darwin; Sir Charles Dodds; Mr. P. A. Le Neve Foster; Mr. John Gloag; Sir Ernest Goodale; Mr. Milner Gray; The Earl of

Halsbury; Mr. A. C. Hartley; Mr. William Johnstone; Lord Latham; Sir Harry Lindsay; Mr. F. A. Mercer; Mr. O. P. Milne; Sir William Ogg; The Earl of Radnor; Mr. A. R. N. Roberts; Sir Harold Saunders; Sir Selwyn Selwyn-Clarke; Sir John Simonsen; Professor L. Dudley Stamp; Sir Stephen Tallents; Sir Griffith Williams, and Miss Anna Zinkeisen; with Mr. K. W. Luckhurst (Secretary); Mr. R. V. C. Cleveland-Stevens (Deputy Secretary) and Mr. David Lea (Assistant Secretary).

ELECTIONS

The following candidates were duly elected Fellows of the Society:

Barwell, Clive, London.
Beeston, Colin Raymond, London.
Bird, Walter Stephen, London.
Boden, Mrs. Margaret, London.
Ehrmann, Hermann Walter, M.A., Sheffield, Yorks.
Eker, Stanley, LL.B., London.
Evans, Paul Glendwr, M.Sc., B.E., A.M.I.C.E., Palmerston North, New Zealand.
Francis, Roy, A.T.D., Cleobury Mortimer, Worcs.
Kaep, Louis J. Greenwich, Connecticut, U.S.A.
Lea, James Hewitt, Leigh-on-Sea, Essex.
Lowe, James Simeon, Birmingham.
Mackay, Edgar, Uxbridge, Middx.
Reiss, George Francis, Kendal, Westmorland.
Roe, Captain Arthur John Talbot, D.S.O., O.B.E., R.N., London.
Spicer, Lancelot Dykes, D.S.O., M.C., London.
Uglow, Edward Mainzer, Brighton, Sussex.
Whitlock, John Wilson, M.A., LL.B., J.P., London.
Whittle, John Alfred, London.
Zeman, William S., B.A., B.LL., Hartford, Connecticut, U.S.A.

The following were duly elected Associate Members of the Society:

Aaron, Martin, London.

Faiers, Miss Heulwen Patricia, Parkstone, Dorset (Examinations Silver Medallist).

Gear, Brian Thomas, Redhill, Surrey (Examinations Silver Medallist).

NEW POSTAGE RATES FOR PRINTED PAPERS

A reply was read from the Postmaster-General to representations made on behalf of the Society regarding the imminent increase in the postal rates for printed matter, which will seriously affect the cost of postage of the *Journal*. In his letter, Dr. Hill stated that, even with the increased rates, the carriage of printed matter would be carried out at a loss and no concessions for privileged classes of mail, such as the publications of Learned Societies, could be considered.

JOURNAL COMMITTEE

Sir Charles Dodds, Mr. William Johnstone and Sir Stephen Tallents were appointed to the *Journal* Committee.

OTHER BUSINESS

A quantity of financial and other business was transacted.

ADVERTISING AND PUBLIC RELATIONS TO-DAY

A paper by

SIR STEPHEN TALLENTS, K.C.M.G., C.B., C.B.E.,

a Member of Council of the Society, read to the Society on Wednesday, 16th November, 1955, with Sir Miles Thomas, D.F.C., Chairman of the British Overseas Airways Corporation, in the Chair

THE CHAIRMAN: All I have to offer you in the way of comment is to remind you of the poster you used to see during the war, 'Is your journey really necessary?' I must ask you 'Is an introduction to Sir Stephen Tallents really necessary?' and I expect the reply to be 'no', because Sir Stephen is a Member of Council of the Royal Society of Arts and anyone who has anything at all to do with public relations well recognizes and knows that he is the doyen of that craft in this country. I know that you are going to listen to what he has to say this afternoon with very deep interest.

Sir Stephen is the most versatile and inspiring character, he has been a distinguished soldier, and the civil servant largely responsible for many of the improvements at the Post Office and at the B.B.C. Further, he is very widely read, a knowledgeable countryman, and a gentleman of letters. The first duty of a Chairman is not to stand between the speaker and his audience and so I give you Sir Stephen Tallents.

The following paper was then read:

THE PAPER

I was happy if, may I confess, also a trifle surprised when, at a meeting within these august walls, a request from a member for a talk on this subject was reported and approved by our Council. I felt much less cheerful when at a later stage I was charged with the responsibility of meeting the request. But it is a subject on which I have had some experience and about which I have formed some convictions. So I felt duty bound to accept the challenge. You will understand how encouraged I was when I heard that Sir Miles Thomas had gallantly agreed to preside this afternoon. I know—and I speak from experience—no better chairman than he. We are all very conscious of the demands which his great responsibilities and wide interests must make upon his energy and his time.

Let me say at the outset that I am not going to attempt either a comprehensive review or any detailed analysis of the immense and ramifying flux of activities which the title of this talk embraces. I am not competent to produce either; and there are many, some of them present in this hall, who could meet such a demand with much better authority than I. Even if I were competent, time would not allow of such a treatment here. I am not, for example, going to touch this afternoon on two activities, essential to the conduct of effective advertising and public relations work—the market research, that study of the target, which

should precede, accompany and follow any extensive well-planned campaign, or that incoming traffic, the reflection of public opinion, which is so important an element in the task of those who conduct it.

I am not going, for all its importance, to pursue, except at long range, the theme summed up in the slogan 'Advertising pays'. It raises vital and interesting questions; but I content myself by remarking that, if it were not broadly and largely true—and not least in its application to our export markets—I cannot believe that this country would be devoting, at the instance of some of its ablest and astutest minds, the £300 million or more which, it is authoritatively estimated, Britain will be found to have expended this year upon advertising. I am simply going to try to convey to you certain impressions and certain convictions to which my personal experience has led me.

May I, in explanation of that approach, briefly present my credentials. My working life until, some years ago now, I reached retiring age, was divided pretty equally between straightforward administration in the public service and then, in several Government Departments and at the B.B.C., what was at first called 'publicity', and later 'public relations' work. Since I retired, I have been, and continue to be, associated with several businesses with very different interests and of very different calibres. That expression has given me an opportunity of weighing and comparing the values and the demands of a variety of callings. Then in these last few years I have enjoyed opportunities of getting a glimpse at first hand of advertising and publicity activities not only here in London but in a number of other great cities, as far north as Edinburgh, Glasgow and Aberdeen, as far west as Dublin.

I like to claim, looking back, that my first entry into the world of publicity was when, about a year after I had joined, as an apprentice to the Government service, the Marine Department of the Board of Trade, I concocted, for the benefit of masters of ships employing Lascars, a simple leaflet conveying the fact that scientific research in Kuala Lumpur had lately shown the disease of beri beri to be due to the eating of polished rice. My second contact with publicity was at the first Ministry of Food, when I observed how the late Lord Rhondda, with the able assistance of Mr. Sydney Walton, projected in the public interest a well-earned reputation as the man who had defeated the menace of the food queues, as one who really felt with and cared for the people. But I first became responsible for the conduct of publicity when, on a May morning in 1926, Mr. Amery, whose recent death many in this room besides me must be mourning, invited me to become Secretary of the newly formed Empire Marketing Board, told me that the Board was promised £1 million a year, of which a considerable part was destined for publicity, and thrust into my hands a report on Fruit, by the Imperial Economic Committee, which I proceeded with dazed eyes to look at, rather than to study, in a small room at the Dominions Office. I will not waste your time by detailing my experiences as a callow apprentice to the arts of advertising. I think I can fairly claim to have learned some things the hard way. But it will not be irrelevant to mention two early impressions which those experiences made upon me.

The first impression was of the startling lack of guidance then to be obtained in official quarters. So far as I could discover, no one in Government circles paid any serious attention to publicity outside the Foreign Office in its dealings with the press, the Stationery Office in its placing of classified advertisements, the Government Adviser on Cinematography, who harboured in impossible conditions a collection of Government films of the Great War, and the Department of Overseas Trade which, under the enlightened supervision of Sir Edward Crowe, to-day a senior Vice-President of this Society, was making a notable contribution to the art of the exhibition. Outside that limited circle, publicity was regarded with a mixture of contempt and fear by my colleagues in the Government Service, and was particularly hateful to the Treasury. Fortunately Mr. Frank Pick and Mr., afterwards Sir William, Crawford—two very different characters—came to my rescue. I always like gratefully to recall the generous contribution which they made to that exciting and painful apprenticeship of mine. I am always amused to remember the blend of comfort and dismay which I derived from Crawford's favourite maxim—'No one knows anything about advertising'.

The second impression was that publicity was one of our dangerous trades. My mentors enjoyed telling me of trans-Atlantic publicity disasters; and scarcely had Crawford told me of the misfortunes of the American soap manufacturer, who printed and distributed an elaborate poster of a girl hanging out a family washing without a wedding ring being shown on her finger, when I ran headlong into a like experience. We had commissioned Macdonald Gill to design, as our first poster, a map called 'Highways of Empire' and, in order to impress with a sense of our activity the Premiers who came to attend the Imperial Conference of 1926, arranged for it to be the principal item of a meagre display of publicity material which we staged in the rooms of the Royal Academy in Burlington Gardens. On the eve of the Premiers' visit of inspection, someone pointed out that it showed polar bears at the South Pole—a gaffe which, full allowance being made for the ignorance of natural history common among Prime Ministers, was likely to be spotted by the Prime Minister of New Zealand. Macdonald Gill and I took hurried counsel together; and he accepted my suggestion that we might save the situation by looping round the mouths of our bears, in strip cartoon style, such puzzled remarks as 'Where are we'. Thus I escaped by the skin of my teeth my first, but by no means my last, threat of a publicity disaster.

There has been an immense growth in publicity activities since that morning just on thirty years ago in which I sat down helplessly facing the Imperial Economic Committee's report on Fruit. Inside the Government service the few disconsolate advisers, to whom alone in 1926 I could turn for advice in Whitehall, in spite of post-war reductions, have multiplied exceedingly, with a department, the Central Office of Information, to handle their specialized needs. When the Prime Minister appoints a new adviser on public relations, the press treats his selection as a subject of importance. In industry and commerce there have been much bolder developments. To-day all our most enterprising industrial and commercial undertakings treat the handling of their advertisements and their

public relations as activities of high significance. One reflection of this growth is to be found in the fact that the Institute of Public Relations, whose foundation I remember hearing modestly debated over coffee in a Soho restaurant about 1945, to-day numbers nearly 800 members, and its office is become a target for enquiries from all over the world. We see more and better publicity increasingly prescribed as the remedy for otherwise intractable defects. Just to give a couple of recent examples in different fields which I have noticed, the Committee on Litter in the Royal Parks prescribed it as the major hope for combating a nation-wide disgrace, while Mr. Basil Blackwell, in the matter of 'rings' at book auctions, wrote of publicity as having 'better teeth than the law'. No wonder that, as anyone thought possibly to have a clue to likely recruits could testify, there is throughout the publicity world a constant and often unsatisfied search for ability and promise.

Now such a development does not come by chance or accident. What then has brought this swift and remarkable development about? If I were to attempt to summarize its causes in a sentence, I should say that during the last quarter of a century ideas have seized power. To-day they dominate us at every level. At one end of the scale they are the most important element in the intercourse of nations. The words of the Unesco Report have become famous—'Since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed'. I always maintain that ideas are to-day both the most powerful of missiles and the most precious of cargoes; and, if anyone asks me, 'what then about the atom bomb?', I reply that it is an idea that restrains its use or might command its release. Are not ideas the major weapon in the cold war? I read only the other day a statement, quoted by the famous Dr. Gallup in a plea for an increase in the expenditure of the United States upon its national publicity, that the Russians were reported to be spending from a thousand to two thousand million dollars a year in getting across their propaganda ideas. Less widely reported, I think, was a remark which President Truman once let drop at a Masonic breakfast in Kansas City. 'The office of President of the United States', he was reported as saying, 'is a public relations office . . . just between you and me and the gatepost', he added, 'I like it'. Mr. Roosevelt before him had declared his faith in advertising. 'If I were starting life over again I am inclined to think that I would go into the advertising business in preference to almost any other. This', he said, 'is because advertising has come to cover the whole range of human needs and also because it combines real imagination with a deep study of human psychology'. If you want historical support, I recall a declaration of Napoleon's that the art of government 'consists in advertising anything well done': and just to show that in Britain, if more reticently, the importance of communications has been eloquently voiced, let me recall a saying which I came across years ago in a State Memorandum, marked secret at the time but at least not less true to-day than when it was written—'Europe is in a tremendous state, and every mutilated division of it looks to England for *Information* as well as *Courage*'. At the other extreme of the scale we read the other day of a captain pleading at the court-martial of a soldier charged with

stealing a 10*s.* note from a comrade that 'his lines of communication were undeveloped'.

Between those two extremes, the need for a modernized system of communications is constantly being voiced; for a better two-way traffic of ideas between employers and workers—Mr. Peter Masefield made an eloquent plea the other day for the breaking down of 'the barrier, the wrought-iron curtain that has been created between the man on the work-shop floor and the man in the executive suite'; for improved channels for the exchange of ideas between trade union officials and their members; for better means of contact between managers and residents in post-war housing estates, even between different groups in a village.

The causes of the revolution, which has thus brought ideas to the front seat, whether among the mighty or among the humble and meek, make a fascinating study. I attempt no complete list; but they include the development of speedier and more widespread channels of transport for men, for goods, for news and for opinions; the constant and constantly accelerating discoveries of scientific research and the need to make their applications more intelligible to those who might profit by them; the growing specialization of industry, which has not only withdrawn industrial operations from the popular eye but has led to individual workers becoming familiar with some fractional part only of the operations in which they are engaged; not least the modern assumption by governments, both central and local, of responsibilities which can only be discharged with the active and intelligent help of those for whose benefit they are undertaken. Whatever the causes, one clear fact stands out. A major need at our time is the development at every level, from the international to the humblest levels of our community life, of a more sensitive, more efficient and more penetrating system of communications than we possess at present.

We already possess, notably in our national and local press, a number of well-tried instruments for the development of such a system. In the motorcar and the aeroplane, the telephone and the typewriter, in wireless telegraphy and sound radio, in films and most lately in television, science during my own lifetime has added a number of new weapons to our armoury. The problem before us is how to adapt our well-tried and enlist our newly-discovered media of communication for the more effective conveyance of facts and ideas, for the purpose of securing better understanding whether it be between nations or between workmates at the bench.

I turn aside at this point to divide the field of operations, actual and potential, into two parts: to divide it between those contributions which every one of us can make and those which demand trained skill. Every man and every woman has daily opportunities for either promoting or damaging the interests of his country, his firm or his own business. Every office, to which the public has access, I always like to recall, is in some sense an embassy. Every letter that goes out to the public has something of the quality of a diplomatic despatch: even the humblest employee has something of the quality of an ambassador for the business he represents. Here none of us is looking at this service from the outside:

we are all compulsorily enlisted in it and not for two years only. I am thinking of such simple points as good manners, good telephone speech, good letter-writing. This is a field of special importance in our foreign relations. A foreign visitor in our midst, a foreign host to a traveller from this country abroad, may well form his most lasting impression of Britain from a meeting with a single individual. My whole impression of Australia, for example, is coloured by memories of the sensitive skill with which, forty years ago last spring, a young Australian nurse—a stranger, of whom I never learned even the name—tended me in a hospital at Rouen.

So much for the personal element. My main concern this afternoon is with activities which demand the enlistment of special gifts and trained skills in great variety. Here my best contribution to the discussion which I hope to lie ahead of us will be to record certain impressions which my own experience and observation have left with me.

Let me preface them by forestalling an almost certain question about the distinction between advertising and public relations work. I have not often heard demands for a definition of advertising. Advertising speaks for itself through more than one mature organization. I have often been challenged to produce a definition of public relations. I could reply by quoting the detailed definition approved by the Institute of Public Relations; but, facing an expert audience such as this, I prefer to parry the question lightheartedly with the story of the golf professional who found a tramp asleep upon his favourite green, kicked him into wakefulness and was met with the protest—'That's not the way to get new members for your club'. I like to declare that public relations embrace all that the professional might have done if he had thought the tramp a desirable member. I hardly think that he would have resorted to advertisement. More seriously, I recognize that it is sometimes difficult in practice to draw a clear-cut line between advertising and public relations work. Factors of internal organization or of personality often enter in. What I am quite clear about is that the two activities are complementary and that, so far from being treated as rivals, they should be recognized as allies, each capable of rendering valuable support to the other, which thus secure, by a combined operation, more effective results than they could have achieved by unconcerted expeditions. And now for my personal impressions.

The first is that throughout our community the importance of the conveyance of ideas and the constant problems which that traffic presents receive far less attention than their importance demands. The main trouble is, I believe, that so many elements in the problem are intangible. The transport of goods and of persons can be scheduled with precision, and its arrivals recorded and reported. No such exactitudes are possible in the transport of ideas. This intangible quality provokes and facilitates ignorant criticism. Incidentally it makes the service a sure target for Treasuries in pursuit of economy. I can speak there from some personal experience. The British Council, whose aims are of true international significance, would, I feel sure, endorse my own from their much wider experience.

This handicap is found even in quarters where expert interest and guidance might be expected. Take the economists, for example. I make no pretensions to be a student of economic literature; but it so happens that earlier this year I was associated with a commission entrusted to the Intelligence Unit of *The Economist* to provide an unbiassed assessment of the values of advertising. One of the reporting team afterwards wrote—'My first reaction on examining the works of the theoretical economists was one of surprise. They seemed to have damned advertising largely by ignoring it'. It seemed clear from the report that most economists, when they come up against advertising, have found themselves facing material different from the other components of the industrial process and have baulked at its study. There is here plainly an important opportunity for economic research. Would that some enlightened Trust or individual would endow that research at least as generously as a great corporation was reported recently to have endowed, at the University of Leeds, the study of the geologies of Africa.

A reluctance to do full justice to the problems of publicity is sometimes to be found nearer to the front. If a new road or railway, for example, an aerodrome, a port or a factory is contemplated, immense care is taken to study all the factors concerned, from the site, both above ground and beneath it, to the details of construction; and the results are presented in a series of elaborate blue prints. How often are comparable pains taken, by those who commission it, to provide material which their agent requires for the essential framing of a publicity campaign? Almost as discouraging from the agent's point of view is the attitude of some clients that they know better than he how to conduct the campaign. I always like the doubtless mythical story of the manufacturer of dog biscuits to whom his agent produced an admirable advertisement with a drawing of an eager tike and the caption—'Dogs like 'em'. The manufacturer put a blue pencil through the caption and substituted for it the sentence—'No more appetising or nutritious fare was ever offered to the canine tribe'.

There are here, I suspect, symptoms of the fact that salesmanship in its broadest sense requires and is not getting as much serious attention as the subject which has received so much emphasis in these last few years, namely, productivity. There are still too many quarters in which the genuine needs and possibilities of advertising and public relations work are either disregarded altogether or dismissed as a necessary evil with a shrug of the shoulders and a perfunctory sanctioning of a publicity appropriation. To such quarters I commend as a cautionary tale the experience of Prabha Dutt Bramachari, a holy man who had preserved an unbroken silence for 31 years. He was a candidate a year or two ago in the Indian elections—and he did not get in.

My own experience, divided pretty equally between straightforward administration and publicity, has left me convinced that the efficient preparation and conduct of publicity is quite as exacting a task as any plain administrative function. It is not, as many suppose, a matter of wining and dining, of lunches and hunches. Entertainment has its place, though its importance is, sometimes evasively, exaggerated. Bright thoughts, too, have their place. There was point,

for example, in Mr. Palmer Hoyt's ingenious suggestion of 1944 that the Americans should bomb behind the Iron Curtain with Sears Roebuck Catalogues. But the prettiest example I have come across of a bright thought realized is credited to Kukichi Mikimoto, the Japanese inventor of the artificial pearl, who late in life arranged a memorial service for the 12 million oysters who had been martyred in the creation of his fortune. Fundamentally, however, the preparation of a publicity campaign implies a complicated programme, involving, among other elements, a thorough study of the material, a precise time table allowing for a quick, short-range output, as in the press, and a slow, long-range output, as on the cinema screen, and the enlistment of a great variety of gifts among those who will contribute to its execution.

Here I venture to interpolate a note—derived from experience and observation gained, so to speak, on both sides of the table—of the difficulties met with in the intrinsically difficult task of securing smooth and effective co-operation between those who commission and those who plan and carry out an advertising or a public relations campaign. The client—whether it be a Government department, a board of directors, or an individual—is rightly absorbed in problems of administration or production: and that very absorption prevents him from looking at his daily work from the point of view of the outside public or from watching for opportunities of bringing it alive to the public. That view point demands a man or a unit continuously on watch from a special and different angle. Here the accumulated knowledge of the expert in aiming, executing and assessing a campaign comes in. His task in modern conditions is to-day indeed what I saw described the other day in an American advertisement as a 'polytechnical job'.

Few men in private life at first sight approve their own portraits. Many clients at first sight are similarly puzzled or even dismayed by portraits of their undertakings prepared in the shape of publicity schemes. They protest, for example—sometimes in apprehension of internal jealousies—that all their activities, and not only those selected by a trained eye, should appear on the canvas. I have seen many promising portraits reduced to a drab and inefficient dullness by this attitude. I am sure that the right policy for the client is to choose his sentry with the utmost care; then to keep him regularly and authoritatively informed of both his policy and his problem; to give him full facilities for studying the material—but thereafter to leave him a very considerable liberty in the execution of his task.

An important aspect of our subject which, I sometimes think, receives too little attention, is that of the secondary dividends which good publicity yields. It was brought home to me years ago now in the two years which I spent as Public Relations Officer at the Post Office. We made films of which the primary purpose was to sell various Post Office services. Some of them—*Night Mail* and *Industrial Britain*, for example—are still occasionally shown on the screen and by a few of us vividly remembered. They fulfilled their primary function satisfactorily. But they also served an internal purpose. They gave to many members of the staff a new view in their entirety of operations—sometimes worldwide operations—of which a small part only could be entrusted to any single unit. They gave, I like to think, to large bodies of the Post Office staff,

whose work, withdrawn from the public eye in sorting offices and telegraph offices and telephone exchanges, could never be observed and was all too little recognized by the public, a sense that at last their faithful service was being recognized ; a sense, also, of belonging to a fine service. That kind of secondary dividend has enhanced value on the labour market of to-day. A man likes not only to get a full view of the processes on which he is working. He likes to feel that he is working for an undertaking of known public repute. It is a factor which not only makes for contentment among those already employed but affects the choice of those, both parents and young people, who are considering where to look for their first openings.

I turn to another aspect of this subject which it seems appropriate to dwell upon in a talk given under the auspices of the Royal Society of Arts and delivered in this fine building—the role of the artist in advertising. Mr. Cecil Notley, in an address entitled 'The Influence of Advertising on Public Taste' at the Advertising Association's Annual Conference last May, claimed that 'advertising men . . . have a great influence, and are often the prime movers, in improving the standards of taste in everyday objects'; and he supported the claim by actual examples. That is an influence which our Design and Industries Association would wish to see exercised to the full. Personally, ever since I came to be concerned with publicity work, I have been impressed by another feature in the relationship between the artist and advertising. To put it very briefly, I believe that publicity, to be fully effective, must appeal not only to the intelligence but also to the imagination, and that this end is most surely achieved by the enlistment of artists in its conduct. The belief could not be better expressed than in words which I chanced upon years later, in the days of my service with the Post Office, in a letter written by John Stuart Mill, the economist, to Thomas Carlyle, the historian—'It is the artist alone in whose hands Truth becomes impressive and a living principle of action'.

I am not here thinking of art in highbrow terms. I am thinking, for example, of the work of the skilled copywriter—work which, I am convinced, demands, besides other uncommon qualities, a real mastery of the English language. I am remembering the contribution which the gifts of the typographer can make to advertising. I have in mind a wide range of material—posters and films, exhibition design, shop window displays, and much else. Only last month, Mr. T. S. Eliot—more strictly, Mr. T. S. Eliot's voice, for he was indisposed on the day and his address had to be recorded—opened at the Victoria and Albert Museum a posthumous exhibition of the work of Edward McKnight Kauffer, the first man to be appointed an Honorary Royal Designer for Industry by this Society. No man in my time had so much influence on publicity design, did so much as he did to show that the artist could give life to a poster or other advertising material. Let me pay that brief tribute to his gifts and to the integrity with which he employed them.

I broached this theme in a little pamphlet, *The Projection of England*, which was published in 1932. We were trying about that time at the Empire Marketing Board to prove its validity in a poster campaign, which owed a great deal to the

earlier work for the Underground Railways and the constant guidance of Mr. Frank Pick; in the series, too, of documentary films which Mr. Grierson inspired and in which he came to enlist the work of such artists as Auden, Benjamin Britten, Robert Flaherty and Cavalcanti. I had long hoped that someone would make out, at proper length and with authority, the case for the artist in advertising: and I was glad to learn, while this paper was in preparation, that Mr. Ashley Havinden, another distinguished Royal Designer for Industry, has fulfilled that hope by writing a book, to be handsomely illustrated, which will shortly be published. By a happy coincidence, too, there will open next Monday in Suffolk Street an exhibition, sponsored by *The Times* and organized by the Advertising Creative Circle, of 'Art in British Advertising'.

I have tried at least to convey in this brief talk my sense of the vital importance of the traffic of ideas and to give some indication of the high roads and the bye roads along which to-day it passes or to which it could, to the national advantage, to-day be directed. There is plenty of work to be done in modernizing that traffic and those roads—in getting too, a move, let me add, on some of those parked vehicles which hug curbs along which traffic should be in motion. There is here work—often daily and quite humble work—for all of us: but the professional part of the job is for the specialists. Let me finally pay a tribute to them.

The spearhead of the operation is to be found in a number of scattered offices and studios, factories and individuals. Our press—national and local, daily and periodical, trade and professional; our broadcasting and television services; our advertising agencies and centres devoted to the promotion of public relations and of market research; the designers and distributors of posters; the makers of films and film strips; those preparing exhibition and shop window displays; those producing magazines and direct mail advertisements; among publishers and booksellers; in printing works and information centres. These, as I see it, and others—for the list is not complete—form, in a loosely linked group, the one workshop in which, year in and year out, this job of modernizing our system of communications is to-day being actively pursued and in which new methods are continually being tested by trial and experiment. It is to that group of callings, or some part of its membership, that every wise organization, and not least the Government, must have recourse for the effective conveyance of ideas. There are those who, when they see an advertisement approaching, or hear talk of public relations, lift their skirts disdainfully and seek to pass by on the other side. There are a few, themselves engaged in that workshop, who do not fully recognize, and are even inclined to depreciate, the long-range significance of their daily work. Of course, advertising has its faults—its exaggerations; even, if you like, in spite of the vigilance of the Advertising Association and kindred bodies, its occasional abuses—and makes its mistakes. So does public relations work. Of what calling, if in most callings the blunders and the extravagances do not meet the public eye, is that not true? Myself, I am convinced of the fundamental importance of the work of this widely ramifying and still developing group; and it was that conviction led me, with all the seriousness and sobriety of a former civil servant, to accept the opportunity given me by this paper to testify to my belief.

DISCUSSION

THE CHAIRMAN: I am sure you will agree that what Sir Stephen has told us this afternoon is destined to become a classical contribution to the furtherance of advertising and public relations. We all owe him a very deep debt of gratitude.

He has brought out several very important points. Ideas are what I would call 'guided missiles', and he is so right in emphasizing the importance of communications for those ideas. Sometimes I wonder whether what we call public relations ought not to be styled public understanding. Certainly you have given us a wider window on that subject this afternoon, Sir Stephen, and we are most grateful to you.

MR. P. R. SULLIVAN-TAILYOUR: Does Sir Stephen think the time will come when public relations will not be regarded as a medium of advertising, but rather the other way round?

THE LECTURER: I think it very much depends upon individual circumstances. At the Post Office, for example—to draw on my own experience—I was Public Relations Officer. I had advertising and other forms of publicity under my control. But many businesses are constructed with advertising as the senior partner and, although I always appreciated the position which I was given by Sir Kingsley Wood at the Post Office, I would not like to lay down the law about it. I think it is partly a matter of terminology. It is sometimes practically difficult to divide the two functions.

MR. JOHN H. LOCKETT: In the course of his most interesting address Sir Stephen referred to a work of his some years ago entitled *The Projection of England*. I remember reading that and being enormously impressed by it and have on several occasions hoped that I might be able to bring it to the attention of younger people than myself in my own particular field of public relations. I have always found it impossible to obtain and I wonder if Sir Stephen could tell us whether it is, in fact, possible to get hold of a copy of *The Projection of England* now?

THE LECTURER: For years I have only possessed, I think, two copies of that booklet myself. However, some months ago Sir Arthur Elton asked me whether I would allow the Film Centre to republish it. I pointed out that it was far from being as up to date as it should be, but that did not deter him. By coincidence just two days ago I got the first copies of a reprint of *The Projection of England*, including a copy of the cover which McKnight Kauffer very generously designed for it at the time.

(*A note about the reprint of* The Projection of England *was published in the last issue of the* Journal.)

DR. ALICE E. BUCK: Would Sir Stephen give his views on why advertising and public relations should have such a sense of inferiority? Surely they are a necessary and legitimate function of the gregarious animal which is man.

THE LECTURER: My whole paper was designed to show how seriously I took advertising and public relations. I did at the end of my paper mention that, even inside the calling, there are those who are apt to depreciate it more than they should. I had hoped that my paper might encourage such as they.

MR. GEOFFREY G. YOUNG: There has been a lot of comment in the press recently about the British Commonwealth and the fact that the possibilities of the Commonwealth are not made known as widely as they should be. Would the speaker say that the time has come for the formation of some Commonwealth public relations

body, maintained by grants from the governments of the various great realms within that Commonwealth, so that the British Commonwealth as such should be better known in this country?

THE LECTURER: I am probably biased in my answer to that question, because in the Empire Marketing Board we had, if with a limited objective, the makings of just such a body, and I make no secret of the fact that I still regret that Board's abolition. I should have liked to see it continued on a basis including, as you suggest, contributions from other parts of the Commonwealth. Any such body, of course, should fortify and never impair each country's individual machinery of projection. But there are, I think, certain aspects and virtues of the Commonwealth which might with advantage be additionally projected by a combined effort, sustained by partners each with an equal voice in its direction and control.

MR. FRANCIS TAYLOR: Could Sir Stephen tell us whether the investigation carried out by *The Economist* into the economic value of advertising was published? Was it favourable or unfavourable?

THE LECTURER: It was commissioned by the Advertising Association, and a summary of it, from which I derived the passage quoted, was published in, I think, the Association's Journal. The full report, my impression is, was in the nature of raw material rather than a finished job and has not been published. I hope we shall get more investigations into the economics of advertising. I think it would repay everybody that it should be properly looked at by an unbiased team of trained economists. That is why I said I wish that someone would make a grant such as has lately been made for a study of the geologies of Africa. It seems to me to be a subject which has been neglected in the past by the professional economists and has suffered to some extent from that fact.

SIR EDWARD CROWE, K.C.M.G. (A Vice-President of the Society): I notice that Sir Stephen has not said a word about the Independent Television Authority. I wonder, if it is permissible, if we can hear what Sir Stephen's views are concerning commercial television?

THE LECTURER: I do not think my views on this subject are worth anything. You have in this room many better authorities on commercial T.V. than I. To begin with, I am something of a 'tied house'. I spent seven years with the British Broadcasting Corporation and my only television set is one which the B.B.C. installed for me, while I was with them, and kindly gave me when I left. It brings me the B.B.C. programme only. Frankly, I have not yet seen the new programmes. I have read the reviews of them with great interest, but it is early days to judge them. Until somebody gives me a machine that will show me their programmes as well as my own, I cannot claim to be a critic.

But, more seriously, I mentioned television in my paper as a very important medium for the conveyance of ideas. I should say that one of the merits of advertising generally is that it is an instrument of a free economy, therefore, if it is any comfort to you, Sir Edward, let us think of the two television services accordingly.

MR. TED JONES: I am frequently a little worried about public relations in its relation to some business houses and associations. We hear a great deal about the good of public relations, but I often wonder if, by gilding it, we do not tend to turn our backs on the evil which it represents in a world which is very much given up to-day to the battle for the individual mind. The history of the past 15 years does not support the view that public relations work is a godsend to humanity. Would Sir Stephen give us his views on this?

THE LECTURER: I am not sure that I personally go about gilding it, but still surely the answer is this: these media are going to be used for the communication of ideas. Let them be used for the communication of truth and not of falsehood. I saw an article in the *Saturday Evening Post* of last September, which maintained that the projection of truth was more effective than the projection of falsehoods. We see a great many falsehoods being projected at enormous expense about the world; and it seems to me a defeatist attitude which you are contemplating—that those who wish to project the truth should sit down and be quiet and let the falsehoods dominate the world.

I do believe that to be fully effective advertisements and public relations should be based on truth. That I think is a cardinal point; but I also noticed that the writer of this article, an experienced man, said that he thought that the truth was always the more powerful—that 'truth will prevail'. I cannot understand how anyone who is concerned with it, as I gather you are, would wish to see the good causes silent while the evil causes are persistently presented to the world through steadily increasing channels.

MR. D. W. LAST: Would Sir Stephen care to carry that statement even further, to let us have more wit and beauty too? One of our most difficult problems, when we are as thick on the ground as we are now—I think in England it is 820 persons to the square mile—is to maintain the tolerance and good manners between people which make life worth living. Is not the function of the artist, in words and in line, colour and design, possibly the greatest propagator of good manners, tolerance, good humour and indeed of community that exists? Shall we not see that theme more fully developed through the media of advertising in the future?

THE LECTURER: I did try in my paper to make out a case for the use of art in advertising. I certainly endorse wholeheartedly the employment also of wit. We see wit effectively employed from time to time, especially, perhaps, in posters. I think anything which brings an advertisement alive is a great asset to it and dullness always is a depreciating factor. If I see an advertisement which amuses me, I remember it better I think than most. I agree with Mr. Last and do not contest anything he said.

MR. ALLAN B. ASHBOURNE: I would like in a humble way to pay a tribute to one particular aspect of Sir Stephen's career. As an advertising man who has become a public servant, my admiration for Sir Stephen's work has always been mixed with astonishment that he should have overcome such an enormous handicap as to start off as a civil servant and become an advertising man!

Sir Stephen's achievements in advertising have earned great recognition. As you, Mr. Chairman said, he is 'the doyen of the profession'. What is less well recognized is the effect that Sir Stephen's career has had on the Civil Service. His career and achievements must have made an enormous difference to the attitude of a large number of government departments towards publicity and public relations. Indeed, if one had a battle with Her Majesty's Treasury the shortest path to victory would be to quote something said or done by Sir Stephen Tallents.

THE LECTURER: I thank the speaker for that handsome testimonial. I am tempted to cap it with a story which some of you may know, a true story of cunning employed for a good purpose. It is the history, now some thirty years old, of the birth of the famous film *Drifters*.

The Treasury were dead set against a second film being made by the Empire Marketing Board. But there was John Grierson, who had been employed in mine-sweepers during the war; there was the Ministry of Agriculture and Fisheries, who wanted something done for fish; and there, by good fortune, as Financial Secretary to the Treasury, was Mr. Arthur Michael Samuel, whom I knew to have written

the standard work on the herring treaties between England and European countries. We had a critical meeting in Mr. Amery's room, at which Mr. Samuel and one of his chief and most hostile lieutenants represented the Treasury. Mr. Samuel came into the conference remarking that he had been a director of a particular firm of mineral water manufacturers and knew that films were no good for publicity. He said that on no account would he allow us to make another film. By the time our meeting had finished, we had put up the project of a film on the herring fishery, and Mr. Samuel had promised that we should have all the help he could possibly give us in its production. It took that mixture of virtue and cunning on our part, and generosity on his, to secure us freedom to get on with our documentary film programmes.

MR. JOHN CRISFORD: In defence of the Treasury, I think I am right in saying that Sir Ernest Gowers was a distinguished member of that body, and he wrote a pamphlet called *Plain Words*. To speak in plain words is in itself something of the art of good public relations.

THE LECTURER: I most heartily agree. I can only speak as an outsider these days; but I have no doubt there has been a complete reform in the Treasury. No one could have done better service than Sir Ernest Gowers in a cause which used to interest me particularly—the stripping of jargon from official files. He did a fine job, and I am happy that you should have reminded this audience of that.

THE CHAIRMAN: I will again on your behalf thank Sir Stephen very much indeed for a most admirable address this afternoon. He has shown us that we were quite right in holding this meeting in the Royal Society of Arts because, as he has said, advertising is an art. He has given a very telling answer to the lady who seemed to query why was it that advertising people always went about in a state of self apology. It is really a form of inverted superiority complex! Thank you very much indeed, Sir Stephen. We shall treasure your words and they will help us in our working days.

A vote of thanks to the Lecturer was carried with acclamation; and, another having been accorded to the Chairman the meeting then ended.

RESEARCH IN INDUSTRY

The E. Frankland Armstrong Memorial Lecture

by

B. K. BLOUNT, M.A., B.Sc., D.Phil.Nat., F.R.I.C.,

Deputy Secretary of the Department of Scientific and Industrial Research, read to the Society on Wednesday, 23rd November, 1955, with R. Holroyd, M.Sc., Ph.D., Director of Research of Imperial Chemical Industries Ltd., in the Chair

THE CHAIRMAN: I was very pleased indeed to be asked to take the chair at this lecture. For one thing I am naturally most interested in the subject, but more than that, I feel it is a very great privilege indeed to be able to take part in any commemoration of Edward Frankland Armstrong.

Most of us who are engaged in the direction of industrial research look on him as one of the outstanding pioneers in this field, to whom we owe a great deal. It was due to efforts of people like him that many firms first realized that scientific research must be regarded as an essential and integral part of any progressive industry, and not just a sideline left to a few specialists who were not going to be allowed a say in the Company's policy.

Armstrong was able to exercise this influence on industrial research largely because he was one of those relatively few people who combined interest and experience on both the academic and industrial sides. I knew of him best on the industrial side in his capacity as Managing Director of the British Dyestuffs Corporation which was, as you probably know, one of the parent companies from which my own Company, Imperial Chemical Industries, was formed. In our Dyes Division, even to-day, the influence of Armstrong's thinking is quite easily discernable.

In addition to these industrial and academic activities, Armstrong was a keen supporter of scientific and learned societies. He was a member of this Society for over twenty years, he was one of the very few non-Royal Presidents of it, and in 1943 he was Chairman of Council. I think it is most appropriate that this Society should have founded a lecture in his honour.

Two lectures have been given so far, and both of them have been on one of his specific interests—the chemistry of food. This third one is possibly even more appropriate, because it refers to research in industry which was his main general interest. I am sure you will agree that, fitting as the subject is, the choice of the lecturer is equally appropriate. Dr. Blount, in his present position as Deputy Secretary of the Department of Scientific and Industrial Research, can perhaps be looked upon rather like a man sitting on the top of a rather high tower surveying impartially research by industry, the Government and the Universities. I do not really like that analogy because, in connection with research, towers are so often associated with the word 'ivory' and denote isolation. Certainly Dr. Blount is not isolated from the practical difficulties or objectives of any kind of research. He has had too much experience for that. As Dean of St. Peter's Hall in Oxford, he has had a good deal of experience of the academic side, in industry he played a key part in the development, staffing and organization of the research department of Glaxo and, just after the war, he had two years as Assistant Research Director in the Wellcome

Foundation. More recently, and just before he joined the D.S.I.R., he was with the Control Commission in Germany, where he did a very great deal to bring about the revival of both German academic and industrial research.

I think that Dr. Blount's experience has been much on the same lines as that of E. F. Armstrong himself, and I therefore have the greatest pleasure in calling on Dr. Blount to deliver the third of the E. Frankland Armstrong Memorial Lectures.

THE LECTURE

I feel particularly pleased, as well as honoured, to have been invited to deliver the third E. F. Armstrong Memorial Lecture: for I have known three generations of the Armstrong family, not only the man whom we are here commemorating, but also his father and his son. His father, the redoubtable Professor H. E. Armstrong, seems now to typify the older generation of scientist. A man of wide-ranging curiosity, he held strong views on many subjects widely removed from his immediate scientific interests, and he was above all a hard-hitting controversialist who served the cause of science well.

It seems worth recording a characteristic story of him. Sir James Irvine told me that in 1937, when he heard that Professor H. E. Armstrong was dying, he went down to Lewisham to see him. He found him in bed, weak and obviously going down hill, but contented and still clear of mind. 'I have been lying here', he said, 'thinking about my life: and I have thanked God for my friends, and I have thanked God for my enemies—both have contributed so much to my enjoyment of it'. 'Enemies' is perhaps a rather strong word: but opponents he had in plenty.

His grandson, Kenneth, the third generation chemist of the family, was of a gentler type, beloved for his personal qualities as much as he was admired for his abilities as a scientist. After graduating in Chemistry at Oxford he spent two years at Harvard as a Henry Fund Fellow, and had only been back just over a year at Oxford when his life was cut short in the alpine snows at the age of 25. He was close in sympathy and interest with his father, and they had co-operated in writing *The Glycosides* and *The Carbohydrates* in the *Monographs on Biochemistry* series. Had he lived he would certainly by now have been one of the leaders of chemical thought.

Between these two mainly academic chemists stands Dr. E. Frankland Armstrong whom we are particularly remembering to-day. He did distinguished research in several fields of organic chemistry, though he never lost his first love for the sugars and glycosides, and he became a Fellow of the Royal Society; but his main contribution lay in the application of his knowledge and experience to the problems of industry. He demonstrated, furthermore, at a time when this was less well recognized than it is to-day, that a technically trained man can be a good manager, for after being chief chemist of one firm he became technical director of a second and then managing director of a third. He played a prominent part in the scientific and professional societies: as a member of the Councils of the Royal Society, the Chemical Society and the Royal Institute of Chemistry;

as President both of the Society of Chemical Industry and the British Association of Chemists: and, as we remember particularly here, as President and Chairman of Council of the Royal Society of Arts.

Good scientist though he was, his great contribution was not so much his own research as his readiness to devote much of his life to bringing research into British industry. What do we mean when we speak of this 'research' that he helped to bring into British industry? We mean, I think, the conscious application of scientific method, against a background of modern scientific knowledge, to the solution of our problems. These problems may arise from our curiosity, or from economic incentive. The former gives rise to what is generally known as pure or academic research: the latter to applied and industrial research. These labels are, of course, not hard and fast, but it is often convenient to use them. For research in this sense to be possible at all, at least three conditions must be fulfilled. It is necessary that man shall have cleansed his mind of at any rate the grosser forms of superstition; that scientific method should have been developed; and that a part at least of the vast corpus of systematic knowledge known as science should have been acquired.

Research depends on the assumption that physical effect follows physical cause, and that the same cause will always have the same effect. So long as man considers that the course of an experiment may depend on the state of the stars or the interference of demons, experiments are scarcely worth making. We are not fully emancipated yet. Astrology is still popular, many people 'touch wood', and 13 is an unpopular number. But we have at any rate learned to keep science and superstition apart, and to treat our superstitions more as the ornaments than as the basis of life. We are still a little like that eighteenth century Frenchwoman who, when asked whether she believed in ghosts, replied: 'No, but I am afraid of them'.

Scientific method is really nothing more than planned experiment and logical deduction, yet its development has been slow and uneven. Long after the decline of superstition had cleared the way, and the familiar steps of formulating the problem, devising and carrying out the experiment, interpreting the result and checking the conclusion had been established and practised in some fields, in others adequate scientific method had made much less headway. Until Bradford Hill's clear and persuasive propaganda in the 1930s for the better understanding of what constitutes a valid deduction, the conclusions drawn in many medical papers and articles were quite unwarranted.

The corpus of scientific knowledge is, of course, growing all the time. In some sciences, it represents the accumulation of a hundred years' firmly-based work, or even more. Physics and chemistry developed quickly, and since early in the nineteenth century useful results have been accumulating. Geology and biology, sidetracked by battles with orthodox religion, developed rather later. Nuclear physics, now almost a separate science—perhaps we should follow the Americans in calling it not nuclear physics but nucleonics—has developed in a spectacular fashion in the last 25 years, and provides as good an example as can be found of the stimulating effect of war on science.

Research, then, is comparatively a very new activity of man. The first beginnings were made in the eighteenth century; it gathered strength in the nineteenth century, but in 1900 it was still little regarded in most quarters. Growth in this century, aided by the practical demonstration of two wars, has been prodigious, and to-day, while many people would be hard put to explain what research really is, almost everybody would concede its importance to the well-being of the nation and of the world.

But if research is new, its application to industry is even newer. It is not easy to say with certainty when research in the modern sense was first applied. At first sight it might seem that this honour should go to alkali manufacture, the forerunner of heavy chemical industry. But though its development shows much ingenuity, it is, even in the case of the Leblanc process, the story of the gradual development of a general method proposed in the middle of the eighteenth century. In fact, it seems to have developed more as a craft industry develops than as the result of research in the sense in which I have used the term. Even the Solvay process, patented in 1861, was based on work done in England 25 years earlier, and indeed the process was not fully successful until 1872. I think, therefore, that we would be justified in selecting for this honour the development of the synthetic dyestuffs in the 1860s. It is well known that the first impetus came from Perkin's accidental production of a mauve colouring matter in 1856. Perkin's observation came at just the right moment. In a century of peace and rapidly advancing material prosperity in Europe, the profits to be derived from synthetic dyestuffs were apparent, and at the same time organic chemistry was just advancing to the stage where rational experiment—research, in other words—was possible. It is interesting to compare Perkin's fruitful but entirely misconceived experiments of 1856—he was attempting to synthesize quinine by the oxidation of allyl-*O*-toluidine, a quite fantastic project on modern ideas—with the work of Graebe and Liebermann 12 years later. They investigated the old and important natural dyestuff madder, determined in 1868 the constitution of the colouring matter, alizarin, to which its properties are due, and next year published a method of synthesis from coal-tar anthracene. By 1871 synthetic alizarin was on the market, and in 1876 the production of natural madder had dropped to one-twentieth of what it had been eight years earlier. This was indeed research in industry, and its success stimulated the great expansion of research into dyestuffs undertaken, almost entirely in Germany, in the next decade. The development in Germany of a great enterprise which had begun in England is often quoted as an example of British industry's lack of enterprise. But this is scarcely fair. It was due at least as much, and probably far more, simply to the fact that organic chemistry had developed in Germany to a far greater extent than in England.

Since those days the use of research in industry has grown very greatly. Progress was at first slow, and war has provided the main stimulus. In the 1914 to 1918 war we received some unpleasant shocks. There was difficulty in dyeing our troops' khaki uniform, for the dyestuffs which we had been using up to 1914 had been of German origin, and our guns were nearly silenced for

lack of the acetone necessary for cordite manufacture. As a result, Government took some positive steps to ensure greater application of research by industry, including the setting up in 1916 of the Department of Scientific and Industrial Research.

The year 1939 found us better prepared. But the course of the war, with its struggle for mastery in aircraft performance, its exciting and enormously important battles for a technical lead in radar methods of detection and deception, and the ultimate development of the atom bomb emphasized the part which science could play. Again war stimulated the application of research to our practical problems.

It is not easy to reach a reliable figure for present-day expenditure. It is probable, however, that in this country Government and Industry are between them spending something approaching £300 million a year on research and development (the two cannot be easily disentangled) while the United States is spending about five times as much.

In his long history man has, of course, achieved much without the aid of research. There was no research in the finding of fire and primitive weapons, in the raising and control of herds, and in ploughing, sowing and reaping; nor in the discovery of the wheel and the development of its uses, in the production of bronze, iron and other materials from which useful objects could be made, in discovering how to construct a right angle. These primitive discoveries were the result of observation, of intelligence and imagination, of the method of trial and error, but not of research. Coming much nearer to our own time and our own country, the British industrial revolution was founded on ingenuity, on inventiveness, but not on research. That is not to belittle the work of the men who made that industrial revolution possible. They showed a remarkable mechanical imagination, for they not only evolved new principles for harnessing power and for performing the complicated operations of several great industries, but they translated them into mechanical devices some of which have had an astonishingly long life. The Reverend William Lee, for example, invented the frame-knitting machine in 1589, and machines based on his original design, practically without alteration, were still in use in the early years of this century. These inventors played perhaps a bigger part than any other class of men in establishing Britain's greatness in the nineteenth century. For though we owe much to our statesmen and our administrators, our soldiers and our sailors, the work of all these men has depended on power, on the financial power which our inventors made possible by laying the foundations of the industrial revolution.

Britain led the world in this, the 'inventor' phase of industrial development. Our very success was dangerous: for, like the hare in the fable, we felt ourselves sufficiently far ahead not to have to bother much about our competitors. For this reason we made a poor start in the research race, allowing our initiative to slip into the hands of Germany and the United States. In more recent times, the success of Switzerland in building up a pharmaceutical and fine-chemical industry repays study. It has been done, I think, in two ways: by the conscious building-up of exceptionally strong schools of organic chemistry in her

universities and technical schools, and by encouraging a close and mutually beneficial co-operation between industry and the academic teacher.

I should like now to say something of the present position of industrial research in this country. It is obvious that there is very great variation in the attention paid to research by different industries. At one end there are industries firmly based on science, like the pharmaceutical, chemical and photographic industries. Without science they could not exist in anything like their present form, and without continuous research they could not maintain their position. It is not surprising, therefore, that they cheerfully plough back a considerable proportion of their profits into research, and represent the most progressive section of industry, not only in the introduction of new products, but also in productivity and labour relations.

At the other end of the scale there are the old-established craft industries, whose operations are based on empirical knowledge acquired over a long period by trial-and-error methods. Such knowledge is, of course, often very sound, and enables first-rate industrial operations to be carried out. Through the years intelligent craftsmen have constantly been noticing the effects of small changes in conditions, and as a result optimum conditions have been discovered and the best methods of control have been established. The managers of these industries know this, and sometimes adopt the attitude that research has no place in their industry: it costs money, and gives them no information which they can turn to use in their manufacturing processes.

This attitude is quite understandable and deserves to be treated with sympathy. Nevertheless, it is wrong; indeed, at the present time it is highly dangerous. For one thing it is not correct to say that research can give no useful information: in fact, most processes can be improved at one point or another if they are only understood. For another, mainly owing to political instability and rapid economic change, supplies of raw materials are much more fickle than they used to be, and manufacturers who want to be sure of avoiding catastrophe must be ready to produce their goods at short notice in new ways. The fur-felt manufacturers, for instance, must be wondering how they would produce high-quality hats if myxomatosis were to destroy the rabbit.

But the most important factor is the disappearance of the old-fashioned type of craftsman. He is the man who spent forty or fifty years superintending an industrial process, and who could, by simple tests that involved looking at or feeling or pulling or smelling or biting some product, control the process accurately. Such men were the products of a simpler age. In the absence of good facilities for education, their intelligence was turned in the direction of minute observation. They served a long apprenticeship, and expected equally long service from their successors. The conditions of the present age are not propitious for such men. The craftsman of the present age will be every bit as good a man, but different. He will have more education, more ambition, and less patience. He can do just as good a job in controlling industrial processes, but he must control them by science and not by intuition. This means that research has had to be brought to the craft industries too. Often such industries are not large,

and are further broken up into a considerable number of small firms, often family firms, employing perhaps a few hundred men, perhaps only a few dozen. For such firms to set up their own research laboratories is plainly impracticable. How, then, has research been brought to them?

Clearly, co-operation within the industry can be the only answer, and it was to facilitate this that the Industrial Research Associations were set up by the Department of Scientific and Industrial Research. These Research Associations, the first of which dates from 1918, are bodies co-operative not only within the industry, but between industry and Government: for Government, in order to encourage the formation of Research Associations, and their operation on an adequate scale, has been and is willing to give grants which amount generally to about one third of total expenditure, provided that industry undertakes to raise the remainder. Control of the Research Association remains, however, with certain safeguards, entirely in the hands of industry.

There are now between forty and fifty grant-aided Research Associations and similar bodies, having together an income of about £4½ million a year, and covering the greater part of British industry for which they are appropriate. This includes not only the old craft industries, but also such industries as iron and steel, shipbuilding, coal utilization, cotton, wool, and laundering. There are, in addition, a few co-operative organizations outside the Government's scheme of grant aid.

The Research Association scheme has, on the whole, been a very successful one. It has enabled many industries to understand the scientific background of their processes, and this has led to instrumentation and better control. It has helped them to withstand the disturbances of raw material supply in peace and war. It has provided them with a competent advisory service to which they can refer their difficulties. It has given the industry a central point for technical discussion and a stimulus for improvement. And it has done all this very economically. Above all, it has economized in that scarce and expensive commodity, scientific manpower, and at the same time ensured that even a small industry can have at its service one or more first-class scientific minds.

I said earlier that the Research Associations cover the greater part of British industry for which 'they are appropriate'. This phrase merits explanation. Some industries are already provided for in other ways. The aircraft industry, for example, has the benefit not only of research done in aerodynamics at the National Physical Laboratory and at the Royal Aircraft Establishment, but enjoys large research and development contracts from the Ministry of Supply. Again, those industries which are most advanced in the use of science, such as the chemical and radio industries, already have large research departments within the individual firms. Moreover, such industries are usually highly competitive between themselves and, though they might be able to co-operate on certain aspects of research, they could scarcely do so in those fields of active advance in which they expect to better their competitors. There is one practical example of this. In 1940 certain firms in the pharmaceutical industry—one of the country's most lively and competitive industries—decided to set up a co-operative research

organization, the Therapeutic Research Corporation. This was never a success, because the member firms would only agree to its pursuing lines of research in which they themselves were not greatly interested—in other words, research of inferior practical value.

Besides research done in industry and in the Research Associations, a good deal of research in which industry is interested is also done in Government research establishments. There are usually special reasons for this. The Ministry of Supply and the Admiralty operate a number of laboratories whose prime purpose is to do defence research. But there is no strict dividing line between defence research and industrial research, and much that is done primarily for the Services is also of interest to industry. I have already mentioned the Royal Aircraft Establishment. The Chemical Defence Research Establishment, to give another example, is interested in toxic gases, but a toxic gas may be an industrial hazard as well as a weapon of war. The position is similar with other defence laboratories, and the establishments of the Atomic Energy Authority. On the civil side, the Department of Scientific and Industrial Research was set up 'to promote and organize scientific research with a view especially to its application to trade and industry', and in carrying out its task it has not only brought the Research Associations into existence but also set up 12 research establishments and taken over responsibility for two which were already in existence. Some of these cover fields which are too wide to be covered by a research association, such as the general responsibility for standards and certification which lies with the National Physical Laboratory. Others deal with subjects for which Government has shown particular concern. Examples are the Food Investigation Organization, the Pest Infestation Laboratory, the Radio Research Organization, which works primarily on transmission problems, and the Forest Products Research Laboratory which has done much to find outlets for colonial timbers. The Building Research Station provides an interesting case. Though its findings are applied by the architectural profession and the building trade, central Government and local authorities, who pay for much of the building which is done, have a special interest in anything which the laboratory can do to lower costs and improve construction.

I must here mention what seems to me a rather interesting development. Although the Department of Scientific and Industrial Research was set up with the interests of trade and industry specially in view, the work of the Department's establishments is tending to develop in quite another direction. I have already mentioned Government's interest in the work of the Building Research Station. The work of some of the other establishments is also of great importance to Government. The Road Research Laboratory, for instance, has both a road-construction division and a traffic and safety division. Without the laboratory's work it would be impossible either to design our roads or control our traffic with any certainty that administrative decisions would not as often be wrong as right. Similarly the work of the Fuel Research Station on the efficiency of coal utilization and the prevention of atmospheric pollution and of the Geological Survey, the Water Pollution Research Laboratory and the Hydraulics Research

Laboratory on the growing problems of our water supplies are indispensable to the proper handling by Government of these difficult questions. The fact is that Government is now operating in several spheres where right decisions cannot be taken by administrative intuition alone, but require also the results of research. There is every indication that this trend will continue. It is as well to realize that Government, both central and local, as well as industry, now requires a research service for its efficient functioning.

Research in industry is, then, a recent activity of man: so it is not surprising that it still presents some problems and unanswered questions. One problem is that of convincing doubtful industrialists that research is an activity on which it is worth spending money. Anyone in contact with industry knows that there are still many doubters; it is also becoming clearer every day that our industrial future depends very largely on ability to use research to put ourselves ahead of our competitors. There is no quick solution to this problem. Time will solve it, we can only hope sufficiently quickly; and meanwhile a hopeful sign is that the younger generation in management often brings in a technical background that its fathers lack. But those who would like to see more research in industry should avoid overstating their case. In the hands of its less skilful advocates research seems sometimes to be offered as a solution to all our industrial difficulties, and it is really nothing of the sort. Good labour relations, efficient production and effective selling are all equally important ingredients of industrial success. Without them, a firm's research, however good, may well be wasted. But it is equally true that, without research to ensure that the right product is made in the right way, these other virtues will not by themselves ensure enduring success. Research is not a panacea, but it is an essential ingredient.

Then there is a group of somewhat interwoven questions. How should research be organized in industry? Who should control it? How should it be controlled? Where should an industrial research laboratory be situated, in the factory or well away from the factory? It must be admitted that there are no very clear answers to some of these questions, and indeed they may in part be of the type to which a general answer is not possible. They are the sort of questions which have to be asked in many industries, and many people are thinking about them and making experiments in organization and control. Government, too, which is now a large employer of scientists, is interested in the answers.

There would, I think, be general agreement on certain points. For instance, that day-to-day running of research—'how' it is done—must be firmly in the hands of a research manager, himself of course a scientist, with the greatest practicable freedom to organize his laboratory in his own way. It is less clear, however, how the problem of 'what' research is done should be settled: that is, what the programme should be and how the various items should be weighted. The research manager, if he is to remain a good enough scientist to direct research well, can scarcely also keep in touch with all the factors which decide a research programme. At the same time, much of the stimulation for new ideas must come from him.

This is the dilemma between management, usually non-scientific in background but with essential practical experience, and the research manager with scientific knowledge and imagination. Neither can see the whole picture; each has essential knowledge which the other lacks. A solution to this dilemma is necessary for the proper planning of applied research, whether it is to be applied in industry or anywhere else. In my experience it was important at times during the war. The soldier in the field often failed to see how science could help him or else let his imagination run riot and asked for the obviously impossible. Since it is easier to give the scientist the opportunity of studying at first hand the problems in the field than it is to teach science to non-scientists, our solution was to push one or two selected scientists as far forward as possible, and let them see for themselves.

Something analogous seems to be the right solution in industry. The research manager, and some at least of the members of his staff, must be put in a position where they have every opportunity of understanding the outlook and interests of their colleagues in other branches of the firm. In a small or medium-sized firm this may happen as effectively in the staff dining-room as anywhere else. But it does stress the importance both of the status of the research manager and the location of the research laboratory. The former must be sufficient to put him in easy contact—that is, in effect, on a level—with the executives in charge of production, sales and other aspects of the firm's organization. Whether or not he is on the Board is not the real point: the essential thing is that he should feel that he has an equal responsibility with the other principal executives in ensuring his firm's success—as indeed he has—and the opportunity to voice his opinions on policy. There is no place as research manager for the man who wants to retire to his laboratory and let the world outside pass by unheeded. On the contrary, it is perhaps no bad thing that he should develop a real interest in the running of other divisions of the firm and even eventually come to wish that he should run the whole thing himself. Or, indeed, that he should do so. I know well of one case—there are no doubt parallels—where the promotion of the chief chemist to be managing director was followed by one of the most spectacular successes that modern British industry can show.

Since the war there has been a tendency, partly caused by the absence of building licences and the availability of country houses, partly as a result of deliberate policy, to put industrial research laboratories at a distance from the factories which they serve. As a matter of expediency this may be justified, but as a policy I think it is mistaken: for it makes close relations with the rest of the business impossible. There are already enough obstacles without adding that of physical separation. It is, however, sometimes argued that basic research should be done at a distance, since otherwise the urgent day-to-day problems always take precedence, and no basic work gets done. If this really happens, however, it seems simply to indicate that the scientific staff is too small or that the management is not good enough: for it is part of management's function to see that staff is used in accordance with the priorities established by policy. If there is a real case for keeping a research team away from the factory, it is

better located at a university, a matter easily enough arranged through a research contract or by the endowment of fellowships. A research team isolated in a country house seems to me to get the worst of both worlds: it lacks the inspiration that a university atmosphere can give and the stimulus that comes from being obviously part of an industrial enterprise.

Another problem is that of ensuring that the results of research are applied. Of course, most research has a content which advances knowledge, and to that extent, provided that it is published, it is useful. But, as far as industry is concerned, unless research is applied it is generally wasted.

Research done in a firm's own laboratory is seldom wasted. It may be unsuccessful; but if it is successful, the firm which has paid for it has a practical interest in using it. The adequate exploitation of work done in Research Associations is less sure. It is true that member firms have paid a good part of the cost, but what is many people's business tends to be nobody's business, and exploitation may suffer by virtue of the very number of firms which have paid to have it done. However, though there may sometimes be delays, experience shows that the exploitation of research done in Research Associations is on the whole satisfactory. The problem is more acute when research of industrial interest is done in Government laboratories. Government must be particularly careful in not seeming to give preference to one firm at the expense of another, but the National Research Development Corporation has been brought into existence to deal, in a more business-like way than Government sometimes can directly, with this difficulty, and is exploring ways of doing it. However, there seems little doubt that, from the point of view of getting it applied, the best place for the conduct of industrial research is in industry, with the Research Associations running not far behind and Government laboratories clearly in the third place.

Up to now, when I have spoken of research I have implied research in the physical and biological sciences. An interesting recent development is the extension of research method into the field of human problems in industry—a subject always of interest to industry, and now, in the social conditions of the present day, of great importance. Much of the pioneering is being done on projects sponsored by joint committees of the Department of Scientific and Industrial Research and the Medical Research Council. This subject is so new that I do not propose to pursue it here; but it will be an exciting field in the next decade.

I have said enough, I think, to indicate that the pattern of research in industry is a confused one. I should like to end by giving an indication of what I think the right pattern will prove to be. First, I am sure that the best place for pure research is in the universities. Research of this type depends more than any other on ideas, and ideas are generated by the interaction of mind with mind, especially young mind with young mind. A university, by its very nature, is one of the places which can never go stale, and it must remain the place from which the driving force of research comes. If industry wants research done outside the factory it should go to the universities, not set up research teams in isolation.

Industrial or applied research will best be done directly by industry in its own laboratories, and the more this work can be located physically and, if I may use the term, spiritually right within the industry the better service it will give. In particular, only thus will the research really correspond with what the industry needs. But there are many cases, and probably there will always be many cases, where research ought to be organized co-operatively. For this purpose the Research Associations exist, and will have a place of continuing importance.

Government is doing directly a good deal of research of interest to industry. To discuss how this activity will develop on the defence side is outside my competence, but I think that every effort ought to be made on the civil side to transfer to industry or the Research Associations any subjects which they can properly handle, retaining only those which clearly have to be in Government hands.

Finally, Government on the civil side now needs the help of research. I would expect this to be a rather rapidly growing need. And just as industrial research requires for its efficient operation that it should be firmly located in industry, so should research for purposes of Government be located within the Government machine.

DISCUSSION

THE CHAIRMAN: I was particularly interested in what Dr. Blount had to say about the direction of research in industry and the importance he placed on having a proportion of research people pass into other departments, so as to ensure a research-mindedness right through the management of the organization. I should like to ask whether he feels it might be desirable to give all research people, as far as possible, at least two years outside research? My own view is that those who return to their research do so with something added to their knowledge and experience which is of very great help to them.

Everything that Dr. Blount said in his lecture was a true gospel as far as I am concerned, at least until the end part, and there, I think, any difference might be due purely to terminology. He did say that pure research ought to be done primarily in the universities, and applied research done mainly in the industry to which that application was to be made. Perhaps we are getting to cross purposes over what we mean by pure and applied research. Personally I feel that there is quite a lot of basic research which should be done in industry, just as much as in the universities. If I might give an example: an industry particularly concerned with catalytic processes could with advantage carry out its own fundamental basic research on mechanism of catalysis. The industry has the incentive and is in a better position than most university schools to know what gaps in fundamental knowledge it is most desirable to fill. Similarly, if industry is looking for a new drug or a new crop protector, I think there is a need for it to do basic research directed to study of the particular disease, or the particular plant concerned.

It is only the people with an object in mind who really know the fundamental work to which priority should be given. That priority might not be the one which would be applied in universities. In that same connection I should like to ask Dr. Blount if he considers it a wise thing to give a lot of sponsored work to university departments? If that got out of hand, as I think to some extent it has got out of hand in America, then I feel it would detract from the real job of fundamental research in universities which is to obtain scientific knowledge without any reference at all to possible applications.

THE LECTURER: Replying to your first point—should a research man go out and do something else for a couple of years?—I think that one ought to distinguish between men who are doing pure or basic research, and those who are doing applied research. At the purer, or more basic, end of science one probably forgets so much in two years, that one would not be anything like as good when one came back: with the growth of scientific literature, it is becoming more and more of a battle to keep the facts in one's mind. I should think, however, that in applied research, where perhaps there is need for more common sense and less knowledge—if that is not too dangerous a generalization—it might work quite well. It ought to be tried. I hope that I.C.I. is doing the experiment; I suspect they are. Perhaps one day they will tell us whether it has been successful or not.

Now the question of pure research in industry—the nomenclature of types of research, is always a difficulty, but I believe that Dr. Holroyd and I feel much the same about this. The point that I wanted to make is that if industry wants to set up an organization for research which is so pure that it ought not to be in the factory, then the best place for it is a university. I quite agree that, as we tackle a practical problem, we are often driven further and further into the more basic side of research: but I think there is a proper distinction between pure research, which perhaps originates out of our own curiosity more than anything else, and basic research which has originated from a practical need.

The sponsoring of research in universities is certainly a thing that ought to be watched. It is not dangerous in this country at the moment, but it would be rather easy to run into an absurd position, which I believe applies in parts of America, where a lot of applied and not very interesting work is put out to university departments, and gladly accepted for the sake of the money, while at the same time very high quality basic or even pure research is done in firms' own laboratories. That is a bad development, which we should try to avoid in this country.

DR. J. VARGAS EYRE: Having had wide experience of Research Associations and of scientific research sponsored and carried out by large industrial organizations I would like to emphasise a point of view that is all too frequently overlooked in discussions of this kind. It is this—how can better use be made of all this work? We are inclined to talk with assurance about 'big business', and our 'big industrial organizations' as though they were predominant in the industrial life of this country: but they are not. The picture one should have in mind is that revealed by the last available census—it is doubtful whether the recent industrial survey will show any spectacular change.

The figures referred to show that 97 per cent of the manufacturing units of this country employ fewer than 300 people each, and only 3 per cent more than 300 people each, and of these latter only about one-half of one per cent employ more than 1,000 people. Clearly, then, we are a country of small specialized manufacturers. It is also of interest to observe that the total manufacture of the country, for home consumption and for export, is shared equally between the 97 per cent and the 3 per cent.

Everything possible should therefore be done to encourage and interest this large proportion of small manufacturers in the immense amount of new information coming forward concerning processes of manufacture and of new raw materials. Whereas large industrial organizations can afford, and generally do employ, special staff to help in these respects, the smaller organizations, comprising this 97 per cent, cannot do so; they are in a completely different situation.

It is then of the highest importance that results, findings and generalizations, coming from the good work of co-operative Research Associations and from other sources, be stated in clear language and in simple terms. This I know is often difficult, but the scientific jargon that comes so easily, and seems so sufficient to those engaged on scientific work, only bewilders and raises doubt and scepticism in the minds of

those whom it is intended to help. In my opinion the salvation of a large part of British industry lies in our being able to illuminate the mind of the small manufacturer concerning these and new opportunities.

THE LECTURER: I fully agree with what you have said. Getting results across, especially to the smaller units, is a difficulty of our own establishments as well as of the Research Associations.

Those Research Associations which deal with the industries composed of many small firms are most conscious of it. Some of them have gone to great lengths to do the job properly, but they have to guard against the danger of putting so much effort into publicising their research that they have no effort left to do research to publicise. On the whole they are doing pretty well.

DR. J. VARGAS EYRE: This point is very important, because this 97 per cent of industry are producing far more than 50 per cent of the goods that are made and used in this country and also exported, and we have got to look after them.

THE CHAIRMAN: The last question raises an interesting point—that is, the place in this country of organizations prepared to carry out sponsored research programmes on a commercial basis. At present we have, I believe, only two small organizations of this type in this country. In the United States there are several very large ones including Battelle, who are now setting up branches in Europe. To my mind they are useful in that they can take a small firm's problem and tackle both the research and technical design aspects of it. Further, if necessary, they can assist the firm concerned during the starting up of any new plants. I should like to hear Dr. Blount's views on this type of organization as distinct from a normal Research Association.

THE LECTURER: The burden of my lecture was that the best place for industrial research is in the firm. So the first point I would like to make is this: that it would be a great pity if firms spent their money on sponsored research in preference to setting up their own research laboratories.

Perhaps firms are more technically minded in America than they are here. Even a small firm there will generally have some technical people in it—not necessarily doing research, but who understand it. But here many of our smaller firms have no technical knowledge, so they can neither formulate their technical problems to a sponsored research organization nor apply the results of the organization's research. I think that in Britain there is a real, but rather limited, place for sponsored research, not as a rule for the small firms, but rather for the larger firms which already have their own research laboratories. If such a firm is active, its research or its trading policy may bring it into new fields. When this happens, it may necessitate research for which the firm's own research laboratory is ill-equipped. For example, a pharmaceutical firm might have an urgent problem in metallurgy. It would be uneconomical to engage metallurgists and set up a metallurgical laboratory to deal with a possibly transient problem, and, in a case like that, I would say that sponsored research is probably the answer. It is quite possible that in the next ten years we may see in this country, especially if the Battelle Institute does set up here, what the demand really is.

MR. G. VIVIAN DAVIES: The trouble with research is that it is such a wide subject that it is a job to know where it starts and where it ends. I was once consultant to a large public Company which did no research of any description, and I found it quite impossible to persuade them to let me have even £50,000 to start some sort of research organization. Of course, like many other concerns, it was run by accountants. The first question they used to ask me was 'what return are we going to get for all this money?' Naturally it was impossible to give any figure. However, I did point out to the Chairman of this Company that he had no facilities whatsoever for trying out new ideas; if they did experiment with anything they had to stop the entire

process while it was being tried. Also, if something went wrong, they had very little means of finding out what caused it.

I was very interested in what the previous questioner said about reports. In this particular industry they had a Research Association, and the Director told me that if only he could get hold of somebody who could write their reports in such a language that the Directors of the constituent firms belonging to the association could really understand them, he would be much happier. Unfortunately so many reports just lie on directors' desks and no action is ever taken on them.

MR. M. H. CADMAN: The small firms, and the large firms for that matter, guard their secrets very jealously. Very often, as soon as a basic idea is born, a patent is taken out to guard the commercial interests. This seems to be one of the biggest hinderances to the sanctioning of basic research outside the industry itself.

THE LECTURER: The sort of basic research I have in mind that might be put out to universities is not often the type which gives rise to patents. They come, if at all, in the next stage.

MR. JOHN CRISFORD: Sir Stephen Tallents recently made a plea here for some research into advertising from the economic point of view. Could Dr. Blount give an opinion on that proposal, and say whether he thinks that the Government might contribute to the cost thereof? The getting of the results of research over to industry is obviously a public relations problem of some magnitude, and one which needs a great deal of attention.

THE LECTURER: I cannot help feeling that the Government would not look very favourably on giving a contribution towards finding out more about advertising. On the other hand I agree that this question of getting information across, which is, of course, an aspect of the same problem, is extremely important. There is already a lot of information, and informed opinion is growing up about the right methods. I have seen admirable leaflets and summaries produced by Research Associations which presented research results in simple words that seemed equally suitable for foreman and managing director. But certainly much presentation falls short of the best.

COMMANDER GORDON NEWTON: Does Dr. Blount agree that it would be a terrible tragedy to make research as done at universities available to everybody? Its findings should not be put up like bottles of Aspirin that you can just take and have by you. The heads of small firms usually have hobbies, and it is quite extraordinary how much a man knows about his hobby when he bothers about it. A firm making normal technical progress is not acting or thinking in terms of research. It is not that you want to prevent the possibilities of research in these forms, but that you want people to realize what variants of research they are going to follow.

Many of the small companies have no means of research at all. They are doing a technical service to another, probably much larger, company. If there is any question of research to be done, it is far more likely to be undertaken by the larger company and passed down as a technical development, which is quite a different thing, to the smaller company which thus gets the benefit. If there is going to be any development of research, surely it is more economic when it is done in the most suitable place? Then one does not find everyone chasing round trying just to be novel.

THE LECTURER: I quite agree.

DR. RICHARD R. ARMSTRONG: Dr. Blount has favoured us with a masterly review of the development of research in industry, but he has left his child, industrial research, without any parents, and I make a plea that he should have given us a little more of its early history.

Speaking from my own early experience of research under the ægis of the Medical Research Council, I was enormously impressed, in the laboratory and outside it,

by the essential need for hitting upon a new method, that is to say an invention, and I would claim, and submit to Dr. Blount, that invention is indeed the father of research. I am quite sure that he would reply that research is the mother of invention.

THE LECTURER: Perhaps I need not reply in that case!

MR. A. WILSON: How would Dr. Blount recommend dealing with the *ad hoc* or short-term problems as opposed to the longer-term projects. Would he have the same people always dealing with the same type of problems; mix them up, or effect a separation?

THE LECTURER: As a general rule, I should have thought it better to effect a separation. If the same people are involved the *ad hoc* work may tend to prevent the longer term projects being done, and the two types of work require rather different outlooks and capabilities. At the same time, contrary to popular belief, the highest quality research man is often very interested in, and competent at, the application of his results. That is a spirit to be fostered. It is really a case of judgment in each individual case; good research direction will know its scientists and deploy them individually to best advantage.

MR. WILSON: Of course, the short term forms the background to the long-term problem.

THE LECTURER: That is often the case, but sometimes I think you can formulate the long-term problem quite simply, and then you can leave it to a man to go into that field and spend possibly a couple of years opening it up. The problem itself may be quite a simply-stated one and not obviously related to its practical application. We know it is related, but its relationship is not obvious to others.

MR. JOHN BUNTON: I was very pleased to hear Dr. Blount refer to the possibility of industry establishing Fellowships at universities, because I think there is a very great scope for such assistance. The only extra plea I would make is that such Fellowships should be entirely without any strings attached, because where there are conditions attached to them, you find that the universities are somewhat reticent, and in any case it must limit the effectiveness of the work that is being done. That, of course, immediately excludes the possibility of sponsored work in universities, which, I believe, is a point that cannot be too greatly stressed.

Now on the question raised by the last speaker concerning short-term work, my own organization has found that it needs three types of laboratories; the first might be called the factory-assistance laboratory, concerned solely with the assistance in the production of our goods, and hence located close to the production line. The second is concerned with the development and design of products to be manufactured, and is usually engaged in comparatively short-term work; but of course, such a laboratory works to a programme closely integrated with the production schedule and is almost invariably under the same roof as the production plant which it serves.

Then there is the applied research laboratory; and here I would agree with Dr. Blount that applied research is usually, though not always, more suitable to industry than is pure research. I do feel, however, that there is a case for the separation of such a laboratory, at least in spirit, from problems of production, either by locating it in a country house, geographically remote from the factory, or by placing an effective barrier round it. I am not suggesting that there should not be an interchange of ideas between the factory and the research laboratory—I believe that this contact is essential—but I also believe that such research work is best conducted if it is not under pressure from its production line. It may be that this can only be ensured by geographical separation, but in any case there should be effective safeguards.

THE LECTURER: Perhaps one should not be too dogmatic about these things. I was putting the opposite point of view, not only because I feel that that is right in most

cases, but also because of my own experience. When I first went into industry as an exceedingly pure scientist, I got a tremendous stimulus from the fact that I was working in the middle of the factory, and could see the goods going out and say 'my work is one day going to be in cases going off all over the world'. Other people may not react that way, but I did.

With regard to Research Fellowships in universities, the sort of thing I had in mind is this: some big firms have set up research laboratories out in the country, open to anybody who likes to visit them, and defend the spending of money in this way by saying: 'We feel that there are certain fields which want opening up, and we would like to get some good men to come and open them up, publishing quite freely. We, in the firm on the management side will, at the right time, be able to jump in and expand any promising lines that emerge'. It is my belief that that type of work can be done quite as well, and probably a good deal better, in a university. In that case it seems to me that there should be no strings attached. I agree with you, however, that in sponsored research, there must be strings. That is why I do not like too much sponsored research in universities.

THE CHAIRMAN: I had hoped that someone might have referred to this question of terminology and encouraged Dr. Blount to go back and alter the title of his organization, the Department of Scientific and Industrial Research. It has always seemed to me that that implies that industrial research is not scientific!

However, we have had an extremely interesting discussion and I am sure that it has shown Dr. Blount, far more than any vote of thanks could have done, how thought-provoking his lecture has been, and how very much we have all enjoyed it. On your behalf I would like to thank him very much indeed.

A vote of thanks to the Lecturer was carried with acclamation.

SIR JOHN SIMONSEN, F.R.S. (a Member of Council of the Society): I am sure we are very glad to welcome here to-day Mrs. Armstrong, Miss Armstrong and Dr. Armstrong's other sister, Miss Norah Armstrong.

I would like to propose a vote of thanks to our chairman. We have heard a lot to-day about the relationship of science to industry. I suppose there is no firm in this country other than I.C.I. which has shown better how to apply scientific research to their industrial problems. As the leader of their research team we have our chairman, and we are very thankful that he has been able to spare the time from his other duties to come here to-day.

The vote of thanks to the Chairman was carried with acclamation and the meeting then ended.

GENERAL NOTES

A NEW MEDAL

The Society's recent exhibition of Modern European Medals demonstrated the potentialities of this form of art for both commemorative and portrait purposes. In the *Journal* for 28th October a new commemorative medal by a British designer was illustrated. The Society has now itself received a new portrait medal by one of its own Fellows. This medal, which is reproduced above, was struck by the City College, New York, in honour of Dr. J. E. Salk and designed by Professor d'Andrea, head of the College Art Department. The Society's copy was presented by the President of the College, Dr. Buell G. Gallagher.

EIGHTEENTH CENTURY ART AT THE ROYAL ACADEMY

Not everyone knows how much the Royal Academy depends for the upkeep of its independent institution and schools on the public's gate-money, the Academy's bequests being quite insufficient for that purpose. Anyone who has been privileged to tour the Royal Academy schools may learn from the keeper that, in paying his admission money to the galleries above, he contributes not merely to his own pleasure and instruction, but also towards the maintenance of deserving, and often impoverished students who throng the historic life room as they have done since the time of Etty.

It follows, then, that the turnstiles at the costly Winter Exhibitions are watched with particular concern by the Academy's officers, and one can only regret that their courage in assembling the unique Portuguese exhibition has so far not been rewarded as amply as might have been hoped. This remains, indeed, an absorbing experience for ordinary visitors; but it has to be said that, apart from one master, Nuno Gonçalves, and several precious objects of art of the Manueline period, there is little to detain the art historian aware of what was being originated elsewhere in Europe; and this apathy seems reflected in the indifference of serious students of art. The moral might be that a widespread response to an exhibition of wholly unfamiliar art can only be expected if it brings to light many unknown masterpieces, as in the Mexican collection brought some time ago to the Tate. It would seem to be unwise, indeed, to set too much store by the initial impact or surprise of a great collection, without this necessary concomitant.

The accompanying Winter Exhibition of furniture, pictures, marbles, tapestries, porcelain, and plate, arranged in the Academy's right-hand wing to illustrate English taste in the eighteenth century, offers, it is true, little surprise to the many amateur students of that period, but demands to be seen if only for the significant choice of the exhibits and the elegance of their setting. The exhibition naturally has a special claim on the attention of Fellows of this Society, more especially in the gallery appointed in the Neo-Classic style which contains a variety of works connected with Robert Adam, besides a self-portrait by James Barry, that aspiring painter in the grand style whose decorations adorn our own lecture hall. This last room of the exhibition forms, indeed, the climax of a survey of styles which closes with the century, thus omitting the last phase of Neo-Classicism, the archæological revival associated with the Regency.

In the early baroque rooms, the Italianate furniture of William Kent, and those Moor Park decorations of Jacopo Amigoni whose mundane and celestial elements are so engagingly combined, take the wandering eye which is charmed again by the sinuous ornament of the rococo, made fashionable by Chippendale and Vile. A fantastic room of mid-century Chinoiseries, and another illustrating the gothic revival in medieval ornament and Strawberry Hill engravings, reflect (as through the small end of an elevated and turning spy-glass) an eighteenth-century society that ordered its amenities with luxury on the principle that the art of living was to be seen and heard to advantage. In the unimaginable future lay the darkened parlour and peering family circle.

The particular virtue of this exhibition lies, as has been said, both in the tasteful arrangement, and careful choice of objects of art to show, so far as possible, the various styles in their purest or 'most intense degree', in the phrase of Mr. Ralph Edwards who contributes an illuminating preface to the catalogue. Thus, to indicate the instructive nature of the collection, Eccardt's portrait of Horace Walpole presides over engravings of Strawberry Hill, Walpole's gothic villa; Rysbrack's marble of Inigo Jones stands near its painted image in a portrait of the great Lord Burlington; and Richard Wilson's *Pagoda at Kew* overhangs a canopied cabinet in similar Chinese taste. It is, indeed, an exhibition designed to please scholars and laymen alike.

NEVILE WALLIS

OBITUARY

MR. H. G. CLARKE

We record with regret the death, at Leamington on 6th December, of Henry George Clarke, C.B.E., at the age of 70.

Mr. Clarke was educated at St. Paul's Practising School, Cheltenham, and in 1913 moved to Leamington, where he was for the rest of his life closely connected with the local press. He was not only chairman and managing director of the *Leamington Spa Courier*, but also a local historian of note, and a well-known figure in the printing trade. He served in 1932-33 as president of the British Federation of Master Printers, and was equally prominent as a newspaper proprietor, being president of the Newspaper Society in 1937-38. He was for some years chairman of the joint labour committee of the two organizations, and had since 1942 been honorary treasurer of the Newspaper Society.

Colour printing was his particular interest, and he had published several works on this subject. He also was an authority on the English Glass picture, and wrote a history of the development of the art between 1690 and 1810. He was created an O.B.E. in 1950, and was promoted to C.B.E. last year. He was elected a Fellow of the Society in 1937.

DR. T. B. DAVIE

We also record with regret the death, on the 15th December, of Dr. T. B. Davie, at the age of 60. Dr. Davie died in London, which he was visiting to represent the University of Cape Town at the installation last month of Queen Elizabeth the Queen Mother as a Chancellor of London University.

Thomas Benjamin Davie, B.A., LL.D., M.D., F.R.C.P., F.R.S.S.Af., Principal and Vice-Chancellor of the University of Cape Town since 1948, was educated at the University of Stellenbosch, South Africa, and at the University of Liverpool. During the 1914–1918 war he was commissioned in the R.A.F. and after the war he taught science in several South African high schools, before returning to this country to take his F.R.C.P. at Liverpool. He then held various University appointments at Liverpool and at Bristol. His medical publications include a *Textbook of Pathology*, written in collaboration with Professor J. H. Dible.

At Cape Town, Dr. Davie maintained the university's traditional practice of admitting without regard of race or colour students capable of benefiting from a university education. While formally opposing *apartheid* in the universities, Dr. Davie's moderate and statesmanlike approach earned the respect of his opponents.

Dr. Davie was elected a Fellow of the Society in February of this year.

SHORT NOTES ON BOOKS

HITTITE ART 2300–750 B.C. *By Maurice Vierya. Alec Tiranti*, 1955. 15*s*

Study of the remains of Hittite art in Turkish and European museums, and in the field, has resulted in this description of the art of the Hittite civilization. The 122 illustrations show the development from the third millennium to the eighth century B.C. These are amplified by descriptive notes, and there is a general introduction.

ROME BEYOND THE IMPERIAL FRONTIERS. *By Sir Mortimer Wheeler. Penguin books*, 1955. 3*s* 6*d*

Evidence of Roman trading in lands far beyond the confines of their Empire is examined by the author in the light of archæological discoveries. His own excavations are important in the tracing of Roman commerce on the shores of the Bay of Bengal. Discoveries in many parts of the world are brought up to date in this book, in which there are many illustrations and maps.

ST. PANCRAS CHURCH AND PARISH. *By Charles E. Lee. St. Pancras Parochial Church Council*, 1955. 21*s*

At the time when the interior restoration of St. Pancras Church has been completed, this history of the church and parish, written by the Churchwarden of St. Pancras, appears. The book contains many photographs and drawings of the church, which has been described by John Summerson as '*the* parish church, *par excellence*, of Regency England'.

DESIGNERS IN BRITAIN. *Compiled by the Society of Industrial Artists. Allan Wingate*, 1954. 45*s*

This fourth volume in a biennial review of industrial and commercial design surveys the trends and developments in this field during the years 1952 and 1953. There is an introduction by Ashley Havinden, and the following pages, containing over six hundred illustrations, are edited by Herbert Spencer. It forms a comprehensive reference book of the subject.

CARRACCI DRAWINGS AT WINDSOR CASTLE. *By R. Wittkower. Phaidon Press*, 1952. 63*s*

In this volume Professor Wittkower has catalogued the collection of works by the three Carracci which is contained in the Royal Library at Windsor. More than 600 drawings by these masters of the Baroque are discussed. Of these 83 are reproduced in large plates and there are 63 smaller figures.

MAKING KNOWN. *By Leonard Hill. The Stratford Press*, 1954. 4*s* 6*d*

Mr. Hill's Chairman's Address to the 1954 Annual General Meeting of the Agriculture Group of the Society of Chemical Industry is reproduced in this volume. It is a plea for the better dissemination of technical and scientific knowledge, and a description of the partnership of author, publisher and bookseller to this end.

FROM THE JOURNAL OF 1855

VOLUME IV. *21st December*, 1855

MECHANICS' INSTITUTION

The following description of the Huddersfield Mechanics' Institution was read at the Institution's annual *soirée*.

The building contains twelve class-rooms. One—"filled with adults, some of whom a few years since were destitute of more than the merest elementary education. Now, many of them are prosecuting the study of the advanced sections of arithmetical study, and in other departments of knowledge possess no mean acquirements. In two adjoining rooms men are still found who are spelling their way through the simplest reading lessons, or having their horny hands guided in the first use of a pen. We still now enter one of the lowest elementary classrooms, where the boys under eighteen assemble. Most of these are from eleven to fifteen years of age. About sixty are present, following the teacher in a simultaneous lesson in grammar. By a succession of these lessons it is sought to fix the study in their minds, and, as in every other department, the pupil moves from class to class through the various branches of the science. Two of these large elementary classes may be especially noticed; one, the junior singing class, where from sixty to seventy are taught the rudiments of music, and a still larger class for free-hand drawing, where the copies of the Government School of Design are used, and from which, through the culture of these youths, the homes of the neighbourhood receive their first acquaintance with true art, and by whose aid the manufacturers may obtain skilled artisans and educated designers".

Some Activities of Other Societies and Organizations

MEETINGS

TUES. 3 JAN. Incorporated Plant Engineers, at the Royal Society of Arts, W.C.2. 7 p.m. *That our main railroads be converted to highways* (Debate).

WED. 4 JAN. Fuel, Institute of, at the Institution of Civil Engineers, Great George Street, S.W.1. 5.30 p.m. R. L. Brown : *Some Coal Research Problems and their Industrial Applications.*

THURS. 5 JAN. Education Through Art, Society for, at University College, Gower Street, W.C.1. 2.30 p.m. Harold Hutcheson : *Advertising—Blight or Benefit?*
Photographic Society, Royal, 16 Princes Gate, S.W.7. 7 p.m. Keith Simpson : *Crime in Camera.*
Refrigeration, Institute of, at the Institution of Mechanical Engineers, 1 Birdcage Walk, S.W.1. 5.30 p.m. H. H. Egginton : *Refrigeration Controls.*

FRI. 6 JAN. Mechanical Engineers, Institution of, 1 Birdcage Walk, S.W.1. 5.30 p.m. G. F. Kennedy and F. J. Hutchinson : *Power Station Auxiliary Plant.*

SAT. 7 JAN. British Interplanetary Society, at Caxton Hall, Caxton Street, S.W.1. 6 p.m. H. P. Wilkins : *Evolution of our Galaxy.*

OTHER ACTIVITIES

NOW UNTIL 31 DEC. (closed 24th and 25th Dec.) Imperial Institute, South Kensington, S.W.7. *The Third Annual Exhibition of the Society of Portrait Sculptors.*

MON. 26 DEC. UNTIL SUN. 1 JAN. Imperial Institute, South Kensington, S.W.7. 12.30 p.m., 1.15 p.m and 3 p.m. Weekdays, 3 p.m. and 4 p.m. Saturdays, 3 p.m., 4 p.m. and 5 p.m. Sundays. *26th and 27th Dec.—3 p.m. and 4 p.m. only.* Films : *Let Go For'ard—United Kingdom ; Returned With Thanks—Singapore ; Brisbane : City in the Sun—Australia.*

MON. 2 JAN UNTIL SUN. 8 JAN. Imperial Institute, South Kensington, S.W.7. 12.30 p.m., 1.15 p.m. and 3 p.m. Weekdays, 3 p.m. and 4 p.m. Saturdays, 3 p.m., 4 p.m. and 5 p.m. Sundays. Films : *Realm of Sound—India ; Blue Ice—Australia.*

FRI. 6 JAN. UNTIL 29 FEB. Victoria & Albert Museum, South Kensington, S.W.7. *Exhibition of Anglo-Jewish Art and History* (1656–1956).